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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,532	10/11/2005	Yasushi Hayashi	MAT-8748US	4368

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EXAMINER	
BAYOU, AMENE SETEGNE	
ART UNIT	PAPER NUMBER
3746	
MAIL DATE	DELIVERY MODE
03/24/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,532	HAYASHI, YASUSHI	
	Examiner	Art Unit	
	AMENE S. BAYOU	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01/28/10* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/02/10 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

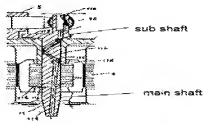
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1- 9 are rejected under 35 U.S.C. 103(a) as being as being unpatentable over Nobuo et al. (Japanese patent publication number S62-44108) in view of Goodnight (6457561) further in view of Choi (5971724) and Khoo et al. (5842420).

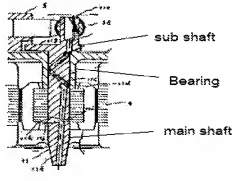
4. In re claim 1, Nobuo et al. disclose lubrication system for hermetic compressor including:

- **Electric compressor ,in figure 1 and 2** ,comprising :a **single phase induction motor (4)** formed of stator and rotor
- A **compressing mechanism (5)** driven by the **motor (4)**

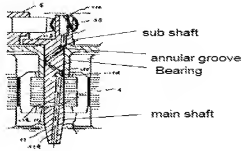
- A **hermetic container (2)** for accommodating the motor (4) and the compressing mechanism (2) and for pooling **lubricant (7)**
- A shaft having a main shaft and sub shaft (shown below)



- A **cylinder (5)** for forming a compressing chamber
- A bearing (shown below) for supporting the main shaft



- A **centrifugal pump (11)** opening into **the lubricant (7)**
- A **forward leading groove (11c)** engraved on an outer wall of the main shaft and having a first end communicating with the centrifugal pump (11a).



- A **vertical hole (11f)** bored in the sub shaft and having a first end communicating with the annular lubricant groove and a second end opening into the hermetic container .Nobuo et al.,however fail to disclose the following limitation which is taught by Goodnight:
- Main shaft comprising a **first section (32)** having a first diameter and a **second section (46)** having a second diameter smaller than the first diameter; **reverse leading groove (44)** having a lead directing in an opposite direction to that of the **forward leading groove (42),**and having a first end communicating with the **centrifugal pump (26), in figure 7-9,14 and columns 3,line 39-50 and column 7,lines 7-11** . However,Nobuo et al. in view of Goodnight fail to disclose the following limitation which is taught by Choi:
- **Leading groove (12)** having a first end within the second section of the shaft (i.e. the smaller diameter portion of the shaft),clearly shown in **figure 2 and 4**. Nobuo et al. in view of Goodnight and Choi fail to disclose the following limitation which is taught by Khoo et al:

- An annular lubricant groove (clearly shown in figure 5) having an inner rim and an outer rim ;**the bearing (64)** defining in part the outer rim of the annular lubricating groove, wherein the shaft includes a the shaft includes a circumferential notch defining in part an inner rim of the lubricant groove, and a **second end of the forward leading groove (68)** opening to the annular lubricant groove the **vertical hole (72)** communicating with the outer rim of the annular lubricant groove ,**(clearly shown in figure 5 and also discussed in column 3,lines 55-65)**.

5 . It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the compressor of Nobuo et al. by adding a revere leading groove as taught Goodnight in order to ensure lubrication during reverse rotation of the compressor. Also since Nobuo et al. already disclosed forward leading groove having a first end communicating with the centrifugal pump and Khoo et al disclose a second end communicating with an annular lubricant groove making the reverse leading groove second end communicating with an annular lubricant groove is a mere duplication. In addition It would have been obvious to one skilled in the art at the time the invention was made to locate the first end of the reverse leading edge in the smaller diameter section of the shaft as taught by Choi since the outer area of the smaller diameter section of the shaft serves as an oil accumulator which facilitates pumping action. Please also note that Goodnight, in column 6,lines 17-20 teaches that the origin of the forward and reverse grooves can be at different locations and selecting the origin point would be obvious to one

skilled in the art since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

6. In re claim 2 Nobuo et al. in view of Goodnight further in view of Choi and Khoo et al as applied to claim 1 disclose the claimed invention:

Goodnight discloses:

- The **reverse leading groove (44)** is formed at the intermediate section of the shaft, in **figure 6**.

7. In re claim 3 and 6 Nobuo et al. in view of Goodnight further in view of Choi and Khoo et al as applied to claim 1 disclose the claimed invention:

Goodnight discloses:

- Crossectional area of the reverse leading groove is smaller than that of the forward leading groove, in **column 7,lines 10-11 and line 35-38.**Please note that such choice of different areas would be an obvious design choice in order to vary the flow rate in the forward and reverse leading grooves.

8. In re claims 4,7 and 9 Nobuo et al. in view of Goodnight further in view of Choi and Khoo et al as applied to claim 1 disclose the claimed invention:

Goodnight discloses:

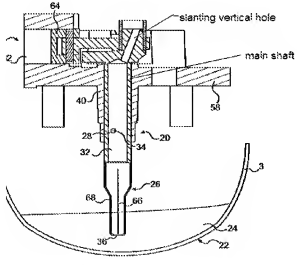
- Lead of the reverse leading groove is greater than that of the forward leading groove in **column 7,lines 10-11 and line 35-38**.Please note that the angle of the reverse (or forward) leading groove with respect to a plane perpendicular to an axis of the main shaft is interchangeable with the Lead.In addition it would have been obvious to

one skilled in the art at the time the invention was made to make the angle of the reverse leading groove to be larger than that of the forward groove simply because the lubricant oil has to go up the hill in the forward leading groove (thus it has to be small to ensure proper flow) while the lubricant oil is assisted by gravity in the reverse rotation and thus to utilize the gravity effect the groove should as much as possible be going close to 90 degree still making sure that the flow remains in the groove.

9. In re claim 5 Nobuo et al. in view of Goodnight further in view of Choi and Khoo et al as applied to claim 1 disclose the claimed invention:

Goodnight discloses:

- A vertical hole slants with respect to a shaft center of the main shaft such that an upper section of the vertical hole slants outward ,in figure 2.



10. In re claim 8 Nobuo et al. in view of Goodnight further in view of Choi and Khoo et al as applied to claim 1 disclose the claimed invention:

Khoo et al et al disclose:

- An entire rounding section of the upper end of the bearing (16) is chamfered (clearly shown in figure 1) and the annular lubricant groove is formed between the chamfered section and the main shaft ,**(clearly shown in figure 5 and also discussed in column 3,lines 55-65).**

Response to Arguments

11. Applicant's arguments with respect to claims 1 -8, filed on March 03,2010 are fully considered but are not moot in view of the new ground of rejection necessitated by amendment.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amene S. Bayou whose telephone number is 571-270-3214. The examiner can normally be reached on Monday-Thursday, 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/Amene S Bayou/
Examiner, Art Unit 3746